AMENDMENT TO THE CLAIMS:

Please cancel claims 1, 72-75, 80, 81, 83 and 85-89, without prejudice, and amend claims 2, 3, 27, 29, 31, 35, 38, 44, 68, 69, 76, 82, 84, 90 and 92, as set forth below.

This listing of claims will replace all prior versions and listings of claims in the Application:

Claim 1 (cancelled)

Claim 2 (currently amended): The photodiode according to claim [[1]]76, wherein said conductive film is a metal film through which said incident light does not pass at locations other than said aperture.

Claim 3 (currently amended): The photodiode according to claim [[1]]76, wherein a region in which a Schottky barrier formed by said conductive film and said semiconductor layer substantially matches a region of generation of said near-field light.

Claims 4-26 (previously canceled)

Claim 27 (previously presented): The photodiode according to claim [[1]]76, wherein said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture.

Claim 28 (previously cancelled)

Claim 29 (previously presented): The photodiode according to claim [[1]]76, wherein said conductive film has a first surface and a second surface, said aperture is formed from said first surface side; and said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture;

said semiconductor layer is a first semiconductor layer of one conductive type and in contact with the second surface of said conductive film; and

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said photodiode further includes a second semiconductor layer of said one conductive type in which the concentration of impurities is higher than in said first semiconductor layer, and which contacts a surface of said first semiconductor layer that is opposite to another surface in contact with the second surface of said conductive film.

Claim 30 (previously cancelled)

Claim 31 (currently amended): The photodiode according to claim [[1]]76, wherein said periodic structure is composed of concentric grooves that take said aperture as center.

Claims 32 - 34 (cancelled)

Claim 35 (currently amended): The photodiode according to claim [[1]]76, wherein said aperture has a bottom surface portion that is a part of said conductive film.

Claims 36 and 37 (cancelled)

Claim 38 (currently amended): The photodiode according to claim [[1]]76, wherein a scattering member composed of a conductive material for scattering light is arranged in said aperture.

Claims 39 and 40 (cancelled)

Claim 41 (previously presented): The photodiode according to claim 35, comprising a scattering member composed of conductive material for scattering light, said scattering member being embedded in said semiconductor layer side extending from an interface between said bottom surface portion and said semiconductor layer corresponding to the position of said aperture.

Claims 42 and 43 (cancelled)

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Claim 44 (currently amended): The photodiode according to claim [[1]]76, wherein said aperture penetrates said conductive film and reaches said semiconductor layer, and of said conductive film, a periphery around said aperture contacts said semiconductor layer.

Claims 45 and 46 (cancelled)

Claim 47 (previously presented): The photodiode according to claim 44, wherein a scattering member composed of a conductive material for scattering light is embedded in a surface of said semiconductor layer corresponding to the position of said aperture.

Claims 48 and 49 (cancelled)

Claim 50 (previously presented): The photodiode according to claim 29, wherein a transparent film having an index of refraction substantially equal to that of said semiconductor layer is provided on said first surface of said conductive film.

Claims 51 and 52 (cancelled)

Claim 53 (previously presented): The photodiode according to claim 50, further comprising an antireflection film for incident light provided on said transparent film.

Claims 54 and 55 (cancelled)

Claim 56 (previously presented): The photodiode according to claim 29, wherein said conductive film is a metal film and the diameter of said aperture is at least 1/10 but no greater than 1/2 the wavelength of said incident light.

Claims 57 and 58 (cancelled)

Claim 59 (previously presented): The photodiode according to claim 56, wherein the period of said periodic structure is equal to or less than the wavelength of said incident light.

Claims 60 and 61 (cancelled)

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Claim 62 (previously presented): The photodiode according to claim 56, wherein the period of said periodic structure is set to a resonant wavelength of the surface plasmon excited on said conductive film by said incident light.

Claims 63 and 64 (cancelled)

Claim 65 (previously presented): The photodiode according to claim 56, wherein said metal film has a thickness no greater than 1000 nm but at least 100 nm at concave portions of said periodic structure, and a depth of said surface irregularities is at least 20 nm but no greater than 200 nm.

Claims 66 and 67 (cancelled)

Claim 68 (currently amended): The photodiode according to claim 31, wherein a thickness of said ~~second~~ semiconductor layer ~~interposed between said first semiconductor layer and said conductive film~~ is at least 50 nm but no greater than 100 nm.

Claim 69 (currently amended): The photodiode according to claim 35, wherein a thickness of said ~~second~~ semiconductor layer ~~interposed between said first semiconductor layer and said conductive film~~ is at least 50 nm but no greater than 100 nm.

Claim 70-75 (cancelled)

Claim 76 (currently amended): An optical interconnection module comprising:

a photodiode ~~according to claim 1~~ for receiving incident~~incidence of~~ light emitted from a first optical fiber to generate a first signal ~~current~~;

a light source for generating a signal light that is irradiated into a second optical fiber; and

a mounting board on which said photodiode and said light source are arranged;

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wherein said first signal ~~current~~ is supplied to an LSI, and said light source generates the signal light in accordance with [[~~the~~]]a second signal ~~current~~ from said LSI;

said photodiode comprising:.

a conductive film having: an aperture having a diameter smaller than the wavelength of said incident light, and a periodic structure provided around said aperture for producing a resonant state by an excited surface plasmon in a film surface of said conductive film by means of said incident light to said conductive film; and

a semiconductor layer provided in a vicinity of said aperture of said conductive film and in contact with said conductive film;

wherein said photodiode detects near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon.

Claim 77 (previously presented): An optical interconnection module comprising:

a photodiode according to claim 29 for receiving incidence of light emitted from a first optical fiber to generate a first signal current;

a light source for generating a signal light that is irradiated into a second optical fiber; and

a mounting board on which said photodiode and said light source are arranged;

wherein said first signal current is supplied to an LSI, and said light source generates the signal light in accordance with the second signal current from said LSI.

Claim 78 (previously presented): The optical interconnection module according to claim 76, further comprising:

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a first optical coupler for optically coupling said first optical fiber and said photodiode; and

a second optical coupler for optically coupling said light source and said second optical fiber.

Claim 79 (previously presented): The optical interconnection module according to claim 77, further comprising:

a first optical coupler for optically coupling said first optical fiber and said photodiode; and

a second optical coupler for optically coupling said light source and said second optical fiber.

Claims 80 and 81 (cancelled)

Claim 82 (currently amended): The optical module ~~according to claim 81~~, comprising:

a photodiode for detecting signal light emitted from an optical fiber to supply it as an electrical signal;

a preamplifier for amplifying the electrical signal;

a case; and

an optical coupler for optically coupling said optical fiber and said photodiode;

wherein said photodiode and said preamplifier are accommodated in said case; and

wherein said photodiode comprises:

a conductive film having, an aperture having a diameter smaller than wavelength of incident light, and a periodic structure provided around said aperture for producing a resonant state by an excited surface plasmon in a film surface of said conductive film by means of the incident light to said conductive film; and

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a semiconductor layer provided in a vicinity of said aperture of said conductive film and in contact with said conductive film;

wherein said photodiode detects near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon ; and

wherein said conductive film has a first surface and a second surface, said aperture is formed from said first surface side; and

said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture;

said semiconductor layer is a first semiconductor layer of one conductive type and in contact with the second surface of said conductive film; and,

said photodiode further includes a second semiconductor layer of said one conductive type in which the concentration of impurities is higher than in said first semiconductor layer, and which contacts a surface of said first semiconductor layer that is opposite to another surface in contact with the second surface of said conductive film.

Claim 83 (cancelled)

Claim 84 (currently amended): The optical interconnection module ~~according to claim 83~~, ~~further~~ comprising:

a photodiode for receiving incidence of light emitted from a first optical fiber to generate a first signal current;

a light source for generating a signal light that is irradiated into a second optical fiber; and

a mounting board on which said photodiode and said light source are arranged;

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wherein said first signal current is supplied to an LSI, and said light source generates the signal light in accordance with the second signal current from said LSI;

a first optical coupler for optically coupling said first optical fiber and said photodiode; and

a second optical coupler for optically coupling said light source and said second optical fiber;

said photodiode comprising:

a conductive film having: an aperture having a diameter smaller than wavelength of incident light, and a periodic structure provided around said aperture for producing a resonant state by an excited surface plasmon in a film surface of said conductive film by means of the incident light to said film surface; and

a semiconductor layer provided in a vicinity of said aperture of said conductive film and in contact with said conductive film;

wherein said photodiode detects near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon ; and

wherein said conductive film has a first surface and a second surface, said aperture is formed from said first surface side; and

said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture;

said semiconductor layer is a first semiconductor layer of one conductive type and in contact with the second surface of said conductive film; and

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said photodiode further includes a second semiconductor layer of said one conductive type in which the concentration of impurities is higher than in said first semiconductor layer, and which contacts a surface of said first semiconductor layer that is opposite to another surface in contact with the second surface of said conductive film.

Claims 85 – 89 (cancelled)

Claim 90 (currently amended): An optical module comprising:

a photodiode according to claim [[89]]92 for detecting signal light emitted from an optical fiber to supply it as an electrical signal; and

a preamplifier for amplifying the electrical signal.

Claim 91 (previously presented): The optical module according to claim 90, comprising:

a case; and

an optical coupler for optically coupling said optical fiber and said photodiode;

wherein said photodiode and said preamplifier are accommodated in said case.

Claim 92 (currently amended): An optical interconnection module comprising:

a photodiode ~~according to claim 89~~ for receiving incidence of light emitted from a first optical fiber to generate a first signal current;

a light source for generating a signal light that is irradiated into a second optical fiber; and

a mounting board on which said photodiode and said light source are arranged;

wherein said first signal current is supplied to an LSI, and said light source generates the signal light in accordance with the second signal current from said LSI; and,

said photodiode comprising:

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a conductive film having: an aperture having a diameter smaller than wavelength of incident light, and a periodic structure provided around said aperture for producing a resonant state by an excited surface plasmon in a film surface of said conductive film by means of the incident light to said film surface; and

a semiconductor layer provided in a vicinity of said aperture of said conductive film and in contact with said conductive film;

wherein said photodiode detects near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon in a depletion region formed at the interface of said conductive film and said semiconductor layer.

Claim 93 (previously presented): The optical interconnection module according to claim 92, further comprising:

a first optical coupler for optically coupling said first optical fiber and said photodiode; and

a second optical coupler for optically coupling said light source and said second optical fiber.

Claim 94 (new): An optical interconnection module comprising:

a photodiode for receiving incidence of light emitted from a first optical fiber to generate a first signal current;

a light source for generating a signal light that is irradiated into a second optical fiber; and

a mounting board on which said photodiode and said light source are arranged;

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wherein said first signal is supplied to an LSI, and said light source generates the signal light in accordance with a second signal from said LSI; and,

said photodiode comprising:

a metal semiconductor junction forming a depletion region in the presence of an applied junction voltage across a metal-semiconductor junction having a metal side;

the junction positioned to receive near field light generated from incident light striking the photodiode from the metal side of the junction through a sub-wavelength aperture due to surface plasmon resonance, and the metal side of the junction comprising a metal film through which said incident light does not pass at locations other than said sub-wavelength aperture, and which metal-semiconductor junction substantially matches a region of generation of said near-field light; and wherein said surface plasmon resonance results from a periodic structure on said metal side of said metal-semiconductor junction composed of surface irregularities having a period in a direction of increasing distance from said sub-wavelength aperture.

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